

# COUNTRY ANALYSIS BRIEFS

## Greece

Last Updated: February 2009

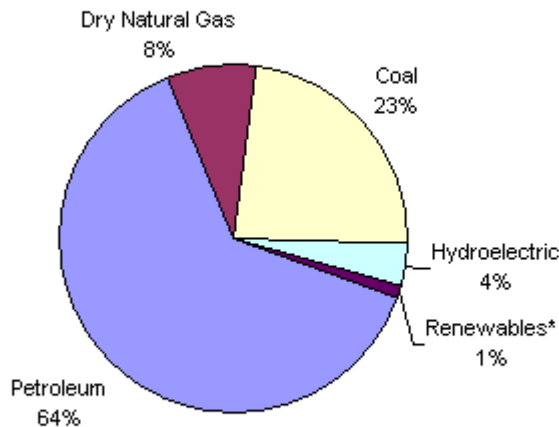
### Background

***Greece has limited domestic energy resources, but it could develop into an important regional transit hub.***

Greece has only minor domestic reserves of oil and gas and relies heavily on energy imports. In 2006, Greece consumed 1.4 Quadrillion Btu (Quad) of total energy of which 64 percent was petroleum followed by coal (23 percent), dry natural gas (8 percent) while hydroelectric and renewable energy combined accounted for 5 percent.



**Greece Total Energy Consumption  
2006**



Source: EIA International Energy Annual 2006.

\*Renewables include: Net Geothermal, Solar, Wind, & Wood and Waste Electric Power

Oil consumption has increased in recent years, but has been outpaced by strong growth in demand for natural gas, driven by the development of new gas-fired power plants. The planned construction of a new oil pipeline from the Black Sea to Greece's Aegean Sea port of Alexandroupolis, the completion of a gas interconnector with Turkey, and the planned completion of a further gas link to Italy will establish the country as an important transit route for oil and gas supplies from the energy-rich Caspian Region to European markets.

## Oil

***Greece has almost no domestic oil production and imports most of its oil from Iran, Saudi Arabia, Russia, Libya and Kazakhstan.***

### Exploration and Production

As of January 1, 2009, the *Oil & Gas Journal* estimated Greece's oil reserves at 10 million barrels. In 2007, Greece produced 1.25 thousand barrels per day (bbl/d). Oil production comes mainly from the Prinos fields in the Aegean Sea offshore Kavala, which have been in production since 1996.

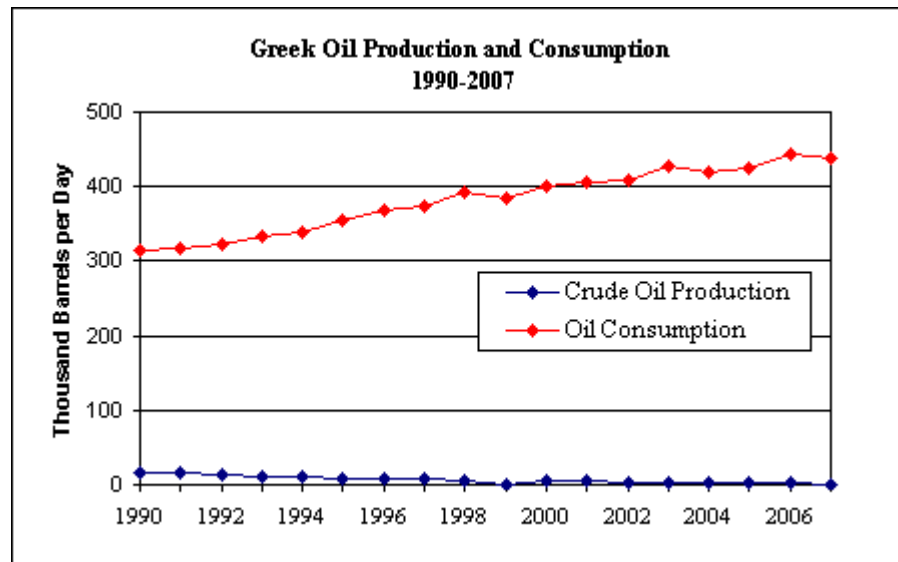
### Sector Organization

Oil exploration was opened up to foreign investors through the Hydrocarbons Exploration Law No. 2289/1995. The first licensing round awarded six exploration concessions in 1996. Foreign companies are still exploring parts of the Adriatic Sea and the Black Sea, usually in conjunction with the state-controlled oil company Hellenic Petroleum (HP) or through Greek subsidiaries. Exploration and development in the Aegean Sea remains contentious due to conflicts over the continental shelf delineation between Greece and Turkey.

Hellenic Petroleum (HP) is the leader in the Greek oil market and is involved in exploration, production, and importation, along with refining, distribution and marketing. The company was formed in 1998 from former state oil company, Public Petroleum Corp. S.A. (DEP). HP manages the rights of the Greek State established under contracts with third parties on hydrocarbon exploration and production.

### Consumption

Oil consumption in Greece has slowed down its rapid pace of growth rising by only approximately 10 percent between 2000 and 2007, from 400 thousand bbl/d to 438 thousand bbl/d, compared to a 35 percent increase between 1986 and 1993. Oil is the main fuel consumed by Greece, accounting for 64 percent of all energy consumption in 2006. The vast majority of Greece's oil needs are imported, primarily from Iran, Saudi Arabia, Russia, Libya, and Kazakhstan.



### Oil Pipelines

While international oil supplies are generally shipped via the Middle East or arrive through the crowded [Bosporus](#) and Dardanelles Straits near Istanbul, Greece is poised to become an important alternative transit route following the completion of the 174 mile Burgas-Alexandroupolis pipeline stretching from the Black Sea to Greece's Aegean Sea port of Alexandroupolis. A trilateral agreement between Greece, Russia and Bulgaria on construction was reached in early 2007, ending over 14 years of disagreements that delayed the project first proposed by Greece in 1994. The pipeline will provide for the export of Black Sea oil shipments on to Europe and world markets while also acting as a bypass route to the Bosporus and Dardanelles Straits.

Initial capacity will be 700,000 bbl/d of Russian and Caspian oil, potentially rising to more than 1 million barrels per day after 2016. The provisional completion date of the initial phase of the pipeline is 2009. Russia's Transneft, Rosneft, and Gazprom Neft are expected to hold equal shares, totaling a 51 percent stake in the pipeline, with the remaining 49 percent shared between Bulgaria and Greece. Kazakhstan is reportedly seeking to purchase some of the shares belonging to Greece and Bulgaria.

### Refining and Petrochemicals

The most significant actor in the Greek refining industry is HP, which operates refineries at Aspropyrgos, Elefsina, and Thessaloniki, along with the OKTA refinery. In 2007, total refining capacity stood at 413,000 bbl/d. About two-thirds of product is sold on the inland market. Greece is largely self-sufficient in the production of lighter petroleum products, although feedstock, heating oil, and lubricants are largely imported. In the retail market, the government exercises indirect price controls by means of taxation and does retain powers to cap prices, particularly in outlying areas. Although the petroleum products market was liberalized in the early 1990s, multinationals seeking to import cheaper finished products from refineries abroad are required to hold security stocks equivalent to 25 percent of their previous year's sales. The added storage costs can often mean that imported products are effectively less competitive, and thus only specialized products are imported. HP is planning significant upgrade work at the 100,000 barrels per day Elefsina refinery, including installation of new distillate hydrocracker and coker units to raise the facility's output.

## Natural Gas

***Greece imports most of its natural gas from Russia but is trying to lessen its dependency by becoming a regional transit hub for natural gas from the Caspian Sea.***

Estimates of natural gas reserves vary, with total reserves considered to be minimal. The *Oil & Gas Journal* estimates Greek reserves to have been 70 billion cubic feet (Bcf) in January 2009. According to EIA estimates, Greek natural gas production was approximately 1 Bcf in 2007, and the country depends on Russian gas and Algerian liquefied natural gas (LNG) imports to meet its domestic demand. Gas currently constitutes a small portion of the Greek energy consumption mix, but this level is growing rapidly as the country invests in new gas-fired power plants.

### Sector Organization

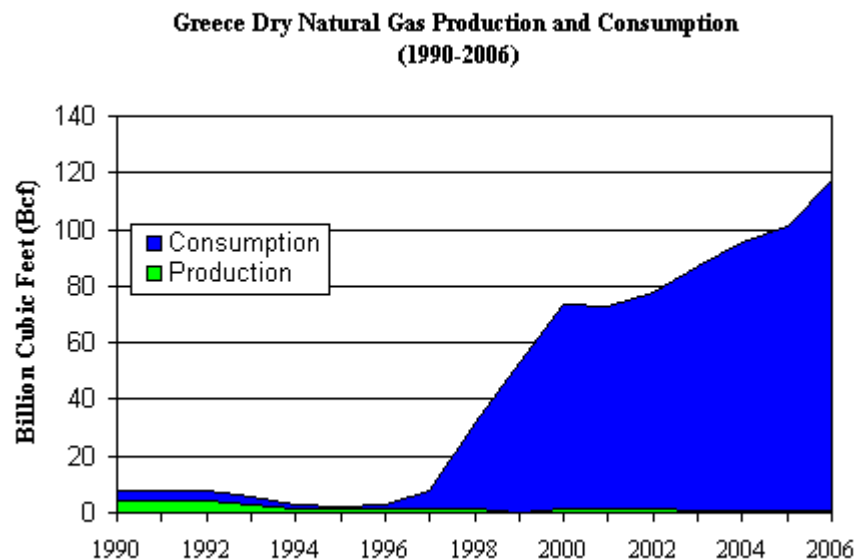
The state-owned Public Gas Corp. (DEPA) was established in 1988 as a subsidiary of Public

Petroleum Corp. S.A (DEP), to manage two gas supply contracts signed with Russia and Algeria and to operate a distribution network. DEPA is the central player in Greece's gas market, although the enactment of a new Gas Law at the end of 2005 has seen a range of market liberalization measures introduced and a greater degree of competition is now beginning to develop. The state currently has a 65 percent share in DEPA, the remaining 35 percent being held by Hellenic Petroleum.

The country's gas-distribution system is still under development. Greece has received a waiver from the European Union on gas-market liberalization, allowing it to postpone a full market opening until 2010. Retail distribution was partially privatized in 2000, when the government sold 49 percent of shareholdings and 30 year management concessions in three gas supply companies to the Italian state-controlled Italgas and to a consortium of Shell International and Cinergy of the United States.

### Consumption

Natural gas consumption has steadily increased over the past 20 years, jumping by over 78 percent between 1996 and 2006 to 17 Bcf. While the rate of growth of consumption may decline from these highs, gas consumption will continue to grow steadily as new gas-fired power plants are installed. Annual demand growth is expected to average 2.8 percent between 2010 and 2030 according to EIA estimates.



### Natural Gas Pipelines

Greece has been developing its natural gas network since 1997, importing from Russia via pipeline and Algeria in liquefied form. Greece is being positioned as a potential regional gas hub and a transit route for the delivery of Central Asian and Russian gas supplies to Europe. A 186-mile interconnector passing under the Sea of Marmara linking the Greek and Turkish gas grids came onstream in 2007. A further extension via the 372-mile Turkey-Greece-Italy interconnectors across northern Greece and the 136-mile Trans-Adriatic pipeline under the Adriatic Sea to Italy is to be built by 2011, paving the way for supplies from Azerbaijan's giant Shah Deniz gas field in the Caspian Sea to be delivered via Greece to Europe. Following the completion of the Turkey-Greece interconnector, Greece began receiving gas from Azerbaijan, although these supplies were halted at the beginning of 2008 following disruptions caused by a dispute between Turkmenistan and Iran. Azerbaijani imports will likely increase as the Turkey-Greece interconnector is further utilized.

Greece also continues to import a substantial proportion of its supplies from Russia and recently signed on to the Gazprom-led South Stream gas pipeline project in April 2008. Greek DEPA purchases 98 Bcf of its supplies from Russia's Gazexport, a subsidiary of Gazprom. Imports from Russia account for 75 percent of Greece's needs with Algerian LNG providing most of the remainder.

### *Poseidon Natural Gas Pipeline*

In January 2008 DEPA and the Italian Edison company signed a letter of intent which established Poseidon SA, a company that will own and operate the Poseidon sub-sea gas pipeline. The 131-mile long pipeline will have a capacity of 282 Bcf. Initially natural gas will come from the Caspian Sea, via Azerbaijan and Turkey by the end of 2012, when it is expected to be completed. DEPA and Edison each have a 50 percent share in the Poseidon pipeline which will run from the Greek port of Stavrolimenas in northwest Greece, to Otranto in southeast Italy.

Other projects that aim to transport Caspian gas to Italy are a pipeline from western Turkey to the Greek town of Komotini, and a 186-mile link connecting Greece's gas pipeline network with Stavrolimenas. The latter is being built at DEPA's expense.

### Liquefied Natural Gas (LNG)

Greece has one LNG import terminal situated at Revithoussa on mainland Greece, west of Athens. Supplies are imported under a contract with Algeria's Sonatrach. Kavala, in northern Greece, has also been considered as a site for a new LNG terminal.

## Electricity

*Greece will likely benefit from greater electricity connections with its neighbors.*

Greece's geography has led to the development of a fragmented electricity system, with less than half of the country's power plants connected to the mainland grid. The majority of power plants are in the north where the lignite fields are located, while the bulk of demand is in and around the region of Attica in the south, where 40 percent of the population and most of the country's industry reside. Interconnection between the country's numerous islands remains low, albeit increasing. Domestic lignite remains the most important fuel for electricity generation, although the use of natural gas is growing rapidly and renewable energy use is also expected to expand. The total system consists of some 12,800 megawatts (MW) of installed capacity with a further 850 MW of interconnectors for imports.

### Sector Organization

Although Greece has liberalized its electricity sector, former state monopoly Public Power Corporation (PPC) continues to hold a dominant position. PPC's effective monopoly has seen prices capped, and power tariffs remain below European Union (EU) averages. It currently operates around 96 percent of all generation, although competition is developing quickly and recently there has been entry of several European power companies to the market, often in partnership with a Greek firm. Transmission services are run by Hellenic Transmission System Operator (HTSO), in which PPC holds a 49 percent stake.

### Coal

In 2006, coal represented a 23 percent share of Greece's total energy consumption, the second largest share after petroleum. Lignite, or brown coal is Greece's only significant fossil fuel resource, with total recoverable reserves totaling approximately 4,300 million short tons (Mmst). Greece is second only to Germany in the EU for lignite coal production and the largest deposits are at Ptolemais and Amintao in Northern Greece. Since Greece has no hard coal reserves, it is imported from South Africa, Russia, Venezuela and Colombia. Domestic production has been partly opened to private companies, but the Public Power Corporation (PPC) remains the largest producer and holds the right to over 90 percent of Greece's production licenses.

### Renewable Energy

Hydroelectricity combined with other renewables including geothermal, solar, wind, wood and waste electric power comprised 5 percent of Greece's total energy balance in 2006. By EU mandate 20 percent of Greece's electricity production must be generated by renewables by 2010. Greece has developed wind parks with installed capacity of roughly 650 MW.

## Profile

### Energy Overview

<b>Proven Oil Reserves (January 1, 2009)</b>	10 million barrels
<b>Oil Production (2007)</b>	1,250 barrels per day
<b>Oil Consumption (2007)</b>	438 thousand barrels per day
<b>Crude Oil Distillation Capacity (2009)</b>	423 thousand barrels per day
<b>Proven Natural Gas Reserves (January 1, 2009)</b>	70 billion cubic feet

<b>Natural Gas Production (2007E)</b>	1 billion cubic feet
<b>Natural Gas Consumption (2007E)</b>	144 billion cubic feet
<b>Recoverable Coal Reserves (2005)</b>	4,299 million short tons
<b>Coal Production (2007E)</b>	73 million short tons
<b>Coal Consumption (2007E)</b>	75 million short tons
<b>Electricity Installed Capacity (2007E)</b>	13 gigawatts
<b>Electricity Production (2007E)</b>	59 billion kilowatt hours
<b>Electricity Consumption (2006E)</b>	56 billion kilowatt hours
<b>Total Energy Consumption (2006)</b>	1.42 quadrillion Btus*, of which Oil (64%), Coal (23%), Natural Gas (8%), Hydroelectricity (4%), Other Renewables (1%), Nuclear (0%)
<b>Total Per Capita Energy Consumption (2006)</b>	139 million Btus
<b>Energy Intensity (2006)</b>	5,684 Btu per \$2000-PPP**

## Environmental Overview

<b>Energy-Related Carbon Dioxide Emissions (2006)</b>	107 million metric tons, of which Oil (62%), Coal (33%), Natural Gas (6%)
<b>Per-Capita, Energy-Related Carbon Dioxide Emissions (2006)</b>	10 metric tons
<b>Carbon Dioxide Intensity (2006)</b>	0.4 Metric tons per thousand \$2000-PPP**

## Oil and Gas Industry

<b>Organization</b>	Partially-privatized
<b>Foreign Company Involvement</b>	BOTAS (Turkey), GN (Spain), Sonatrach (Algeria), Gazprom (Russia)
<b>Major Oil Fields</b>	Prinos, Kallirachi
<b>Major Oil and Gas Ports</b>	Alexandroupolis, Reuithoussa, Thessaloniki
<b>Major Pipelines</b>	South Caucasus Pipeline; Turkey-Greece pipeline; Poseidon pipeline
<b>Major Refineries</b>	Aspropyrgos (135,500 bbl/d), Elefsis (100,000 bbl/d), Thessaloniki (67,000 bbl/d)

\* The total energy consumption statistic includes petroleum, dry natural gas, coal, net hydro, nuclear, geothermal, solar, wind, wood and waste electric power.

\*\*GDP figures from Global Insight estimates based on purchasing power parity (PPP) exchange rates.

## Links

### EIA Links

[EIA Data for Greece](#)

[CIA World Factbook, Greece](#)

[U.S. Department of Energy's Office of](#)

[U.S. Department of State Consular Information Sheet, Greece](#)

[Centre For Renewable Energy Sources \(CRES\)](#)

[EarthTrends: Greece Country Profile](#)

[Greece.com: Government](#)

[Greek Connection](#)

[Helapco: Hellenic Association of Photovoltaic Companies](#)

[Hellenic Petroleum \(HP\)](#)

[Motor Oil \(Hellas\)](#)

## Sources

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Oil and Gas Journal

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World Gas Intelligence  
World Markets Energy

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